

REMOVAL OF HEAVY METALS FROM SOLID WASTE AND THE APPLICATION OF THE LATTER TO AGRICULTURE

Jan GASIOREK and Ryszard KOZLOWSKI

Institute of Natural Fibres, ul. Wojska Polskiego 71 b, 60-630 Poznań, Poland

E-mail: jgasiorek@inf.poznan.pl

EXTENDED ABSTRACT

This paper presents results of laboratory-scale anaerobic treatment studies of the desulfurication process of waste activated sludge. The sludge of high content of the heavy metals was derived from the waste-water treatment plant at Czestochowa. The anaerobic first stage of the treatment system proceeded in a fermentation reactor in the presence of a population of sulfate-reducing bacteria, e.g. *Desulfovibrio desulfuricans*. The second stage was carried out in the presence of *Thiobacillus ferrooxidans* bacteria in an aerated reactor, which served for the extraction of heavy metals during bioleaching of the sludge derived from the first stage treatment. The yield of heavy metal removal after each stage of the sludge treatment is reported. The organic sludge obtained after the second stage of the treatment can find application to agriculture as its heavy metal content is very low. The liquid product, after phosphates and heavy metal hydroxides are removed from it, can be used in the treatment plant as a carbon source for microorganisms capable of removing nitrogen and phosphorus during waste-water treatment. The studies presented in this paper are a part of the recycling project called ITP (Integrated Treatment Plant) which consists in including the desulfurication process into the technology of waste-water treatment with activated sludge.

Key words: solid waste, activated sludge, heavy metals, *Desulfovibrio desulfuricans*, desulfurication, *Thiobacillus ferrooxidans*, heavy metal bioleaching, organic fertilizer.